

REMARKS/ARGUMENTS

The non-elected Claims 1 - 10 have been cancelled. Claims 13, 15, 16, and 17
have been cancelled because the limitations have been moved to up into respective
independent Claims 11 and 15. Independent Claims 11 and 15 have been rewritten to
include dependent claims 12-14 and 16 and 17 respectively. No new matter has been
added.

11
12
14

Reconsideration of the rejection of Claim 16 under 35 U.S.C. 112, second
paragraph, as being indefinite for failing to particularly point out and distinctly claim the
subject matter which applicant regards as the invention, is requested, in light of the
following arguments.

The limitation "flexible tube" has been moved up to dependent Claim 12.

Claims 1-10 have been canceled for reasons pointed out by the Examiner, no new
matter has been entered.

Reconsideration of the rejection of Claims 11-14 and 17 under 35 U.S.C. 102(b)
as being anticipated by Stadler et al. (U.S. 5,451,267), is requested, in light of the
following arguments.

Briefly, applicants wish to point out the major features of their invention which is

a novel and cost-effective process for stripping and cleaning organic coatings. The removal of residual glaze from, "hard to get to", sidewalls formed in etched metallic layers of semiconductor wafers. Cleaning is accomplished while the wafers are contained in a carrier cassette and immersed in a liquid chemical. The use of a quartz plate of a design having a sinuous groove and a plurality of holes in each fold of the windings. The period of the windings match the spacing between the wafers in the cassette. The holes in the quartz plate form a drill jig guide.

A continuous length of flexible hose is inserted into the sinuous groove windings and holes of a prescribed diameter drilled into one side of the tubing. The drilling is guided by the drill jig holes in the quartz plate. One end of the tubing is connected to a pressure regulated gas and the other end plugged. The gas exits the tubing through the drilled holes, bubbling up while scrubbing the boundary surfaces of each wafer.

While Stadler et al. teaches a method for homogeneously gassing a cleaning liquid by the use of a feed pump for mixing a gas and a liquid where a relative velocity of the gas bubbles and the liquid in the propelled treatment medium in relation to a velocity component in the direction of the workpieces is essentially zero. The process of Stadler is directed more towards the uniform etching of wafers as opposed to the cleaning of organic residue from pockets and sidewalls. The applicant's own invention relies on the scrubbing effect caused by the boundary layer of liquid adjacent the wafer's surface. and the velocity of bubbles rising upwards past the surfaces of the wafers.

We have reviewed the related art references made of record and have determined that none of these suggest the present claimed invention.

Attached hereto is a marked-up is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned.

“Version with markings to show changes made.”

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification

Please replace the following paragraph:

Replace the paragraph beginning at page 1, line 25 with the following rewritten paragraph:

--U.S.Pat.No.5,704,981 issued January 6, 1998 to Kawakami et al., recites a buffer plate for distributing gas in a reactor.--

In the claims:

Claims 1 - 10 have been canceled.

Please amend claims 11-17 as follows:

11. (AMENDED) A method for removing organic materials from a plurality of substrates having surface patterns with prominent sidewalls comprising the steps of:

- providing an open tank containing a liquid chemical;
- providing a quartz gas distribution plate means submerged and supported

by bottom of said tank;
 providing a pressure regulated gas supply means connected to said gas
 distribution plate[:];
 providing carrier means containing a plurality of substrates, [and]
 submerging and resting said carrier means [there]on said gas distribution
 plate so that a liquid chemical will ^{contact} all surfaces of said substrates that are
 totally submersed and supported vertically;
 said gas distribution plate generates and directs gas bubbles thereunder
 and parallel to surfaces of substrates positioned thereabove[.], said gas
bubbles providing a chemical-mechanical scrubbing.

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12. (AMENDED) [A method for removing organic materials from a
 plurality of semiconductor wafers having top metal lines with prominent sidewalls
 comprising the steps:] The method according to claim 11 further comprising
the steps of:

[providing an open tank containing a liquid chemical;
 providing a gas distribution plate means submerged and supported
 by bottom of said tank;
 providing a gas supply means connected to said gas distribution plate:
 providing carrier means containing a plurality of substrates, and
 submerging and resting carrier means thereon gas distribution plate so
 that substrates are totally submersed and supported vertically;
 said gas distribution plate generates and directs gas bubbles thereunder
 and parallel to surfaces of substrates positioned thereabove.]
said provided quartz gas distribution plate means having a top surface
separated from a bottom surface, said bottom surface having a sinuous
groove with a flexible tubing urged into and guided by said sinuous

no steps

groove, each parallel leg of said sinuous groove having at least a pair of holes formed through to said top surface, said holes are used as a drill jig guide for drilling prescribed diameter holes in each leg of said flexible tubing;

said flexible tubing having a first end connected to a gas supply means and a second end that is capped;

13. (AMENDED) [The method of claim 12 wherein said means to hold a plurality of wafers is a cassette having appropriate openings therein so that a liquid chemical may reach said plurality of wafers when said cassette is submerged.] The method according to claim 11 further comprising the steps of:

no steps
said provided quartz gas distribution plate means having a plurality of elongated slot openings extending from the top surface to the bottom surface contiguously disposed between said parallel segments, said slot openings transversing length of said plate, said slot openings facilitate tank cleaning and maintenance.

14. (AMENDED)) [A method for stripping photoresist from a plurality of semiconductor wafers having top metal lines with prominent sidewalls comprising the steps:] The method according to claim 11 wherein providing said process steps using a quartz gas distribution means eliminates photoresist residues in the hard to get places, such as wafers with top metal sidewalls, that are coated with polymer, said method is cost effective compared with commercial megasonic or mechanical vibratory methods. *11/2/2*

15 (AMENDED)[The method of claim 11 wherein said gas distribution plate is made of a corrosion resistant material.] A method for stripping

photoresist from a plurality of semiconductor wafers having top metal lines
with prominent sidewalls, comprising the steps of:

providing an open tank containing a liquid stripper;
providing a quartz gas distribution plate means submerged and supported
by bottom of said tank;
providing a pressure regulated gas supply means connected to said gas
distribution plate:
providing cassette means containing a plurality of wafers, and
submerging and resting said cassette means [there]on said gas distribution
plate so that a liquid chemical will contact all surfaces of said wafers that
are [totally] submersed and supported vertically;
said gas distribution plate generates and directs gas bubbles thereunder
and parallel to surfaces of wafers positioned thereabove[.] said gas
bubbles providing a chemical-mechanical scrubbing.

*not
marked up*

16. (AMENDED) [The method of claim 11 wherein said flexible tube is of
a corrosion resistant material.] The method according to claim 15 further
comprising the steps of:

said provided quartz gas distribution plate means having a top surface
separated from a bottom surface, said bottom surface having a sinuous
groove with a flexible tubing urged into and guided by said sinuous
groove, each parallel leg of said sinuous groove having at least a pair of
holes drilled through to said top surface, said holes are used as a drill jig
guide for drilling prescribed diameter holes in each leg of said flexible
tubing;
said flexible tubing having a first end connected to a gas supply means and
a second end that is capped;

*112/1
enable*

approx

17. (AMENDED) [The method of claim 11 wherein said gas supply is a pressurized and regulated gas.] The method according to claim 15 further comprising the steps of:

said provided quartz gas distribution plate means having

a plurality of elongated slot openings extending from the top surface to the bottom surface contiguously disposed between said parallel segments, said slot openings transversing length of said plate, said slot openings facilitate tank cleaning and maintenance.

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